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Unpacking professional shame: Patterns of White male engineering students living in and out of threats to their identities

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Abstract

Background: Although prior research has provided robust descriptions of engineering students' identity development, a gap in the literature exists related to students' emotional experiences of shame, which undergird the socially constructed expectations of their professional formation.

Purpose: We examined the lived experiences of professional shame among White male engineering students in the United States. We conceptualize professional shame to be a painful emotional state that occurs when one perceives they have failed to meet socially constructed expectations or standards that are relevant to their identity in a professional domain.

Method: We conducted unstructured interviews with nine White male engineering students from both a research-focused institution and a teaching-focused institution. We used interpretative phenomenological analysis to examine the interview transcripts.

Results: The findings demonstrated four themes related to how participants experienced professional shame. First, they negotiated their global, or holistic, identities in the engineering domain. Second, they experienced threats to their identities within professional contexts. Third, participants responded to threats in ways that gave prominence to the standards they perceived themselves to have failed. Finally, they repaired their identities through reframing shame experiences and seeking social connection.

Conclusions: The findings demonstrate that the professional shame phenomenon is interwoven with professional identity development. In experiencing professional shame, White male students might reproduce the shame experience for themselves and others. This finding has important implications for the standards against which members from underrepresented groups may compare themselves and provides insight into the social construction of engineering cultures by dominant groups.

1 | INTRODUCTION

> Little [Martin] inside my brain [is] holding up a measuring stick of my smartness and holding up someone else's smartness and going, "That doesn't match." And then … it's just kind of a feeling of, "Oh no. They're going to have expectations of me to be smarter than I am," because I don't catch onto things as quickly sometimes as people think I might. So, I'm like, "Oh no. They're going to expect me to be smarter than I feel sometimes" … I don't like to set high expectations because I don't like causing people to feel disappointment. (Martin)

Here, Martin (pseudonym), a White male third-year electrical engineering student, described feelings of pressure to be a high performer in intellectual achievements. Yet while "smartness" was central to what he felt was expected of him, he visualized his failure to achieve such expectations as a smaller version of himself measuring his perceived inadequacy against the perceived competence of others. As we unpack in this article, Martin was acutely experiencing professional shame in relation to his identity in the domain of engineering education.

We conceptualize shame to be a sociopsychological interaction between cultural expectations and the painful emotional experience that occurs when individuals perceive they are failing to meet such expectations (Brown, 2006; Gilbert, 2003; Huff et al., 2016, 2018; Huff, Okai, et al., 2019; H. B. Lewis, 1971; M. Lewis, 1995; Scheff, 2003; Tangney & Dearing, 2002). The professional domains of engineering education and practice provide multiple standards or expectations that define the competencies associated with being an engineer (e.g., ABET, 2019; National Academy of Engineering, 2004). Beyond formally articulated expectations associated with being an engineer, prior research has demonstrated the particular racial and gendered expectations that shape engineering identities (Faulkner, 2007; Hatmaker, 2013; Jorgenson, 2002; Pawley, 2009; Seron et al., 2018). Thus, the engineering domain provides a ripe context to investigate the patterns of emotion that individuals experience when they fail to meet such socially constructed expectations in the professional domain—that is, lived experiences of shame.

In this study, we interviewed White male engineering students to understand how shame motivated behaviors of majority race–gender students in engineering contexts and how such individuals might attempt to marginalize others as a way of coping with their own experiences of shame (Bond, 2009; Tangney & Dearing, 2002). Our motivation was informed by previous work, which has established that common narratives in engineering that include explicit or implicit forms of exclusion are often formed by members of the dominant social group (Faulkner, 2007; Pawley, 2009). To be sure, prior engineering education research has investigated and powerfully demonstrated the identity-related experiences of those who are marginalized in engineering (Brewer et al., 2015; Danielak et al., 2014; Foor & Walden, 2009; Hatmaker, 2013; Kendall et al., 2019; Secules et al., 2018). However, considerably less research has examined how the experiences of students in majority race–gender populations contribute to the phenomenon of marginalization within engineering cultures. The shame responses of White males constitute a potentially potent force in coconstructing the cultural expectations that prompt students to evaluate the degree to which they have met these expectations, which can influence whether and how all individuals are included and excluded within the professional domain of engineering education.

2 | PROFESSIONAL SHAME

Informed by relevant psychological and sociological literature, we define the construct of professional shame as having four important features: (1) Individuals perceive themselves to have failed to meet socially constructed expectations that are relevant to their identities in a professional domain; (2) individuals experience a painful emotional state amid such perceived failure; (3) individuals attribute the failure to meet expectations to an inadequate whole, or global, self rather than a domain-specific feature of a certain identity; and (4) individuals within professional domains not only experience the emotional state of shame but also contribute to expectations that establish the conditions for professional shame to occur.

In Figure 1, we conceptualize professional shame as the sociopsychological interaction between cultural expectations and individuals' internal evaluations of how they are meeting these expectations (Huff et al., 2016, 2018, 2020). Individuals are actors in the shame experience in at least two ways. First, upon failing to meet a certain expectation or
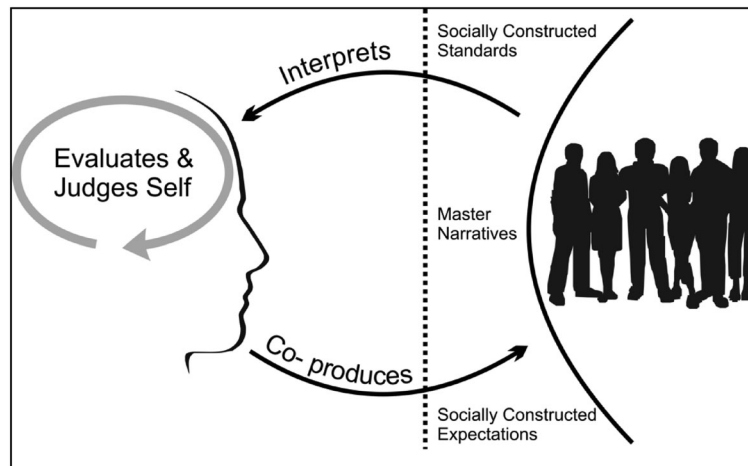
FIGURE 1 Theoretical framework of professional shame

standard, shame occurs when individuals interpret the failure as a holistic devaluation of their global identity. Second, individuals take part in group behavior that reinforces the social expectations that construct the sociocultural backdrop of shame.

2.1 | Shame as an individual emotional experience

Prior literature has established a consistent framework to understand how individuals experience shame. As conceptualized by psychologist Helen Block Lewis, shame is a strikingly painful, self-conscious emotion that involves a global devaluation of the self (H. B. Lewis, 1971; Tangney & Dearing, 2002). In relation to Lewis's characterization of shame, other psychological researchers have characterized shame "as an assault on the self, where the individual's self-concept, social connection, and sense of power and control come under attack" (Van Vliet, 2008, p. 233) or "a felt sense of unworthiness to be in connection ... with the ongoing awareness of how very much one wants to connect with others" (Jordan, 1997, p. 147). Specifically, a person's perceived social expectations are internalized as a standard for equally subjective, oftentimes harsh, and self-defeating judgments of one's own belonging to the social group (Brown, 2006; Tangney & Dearing, 2002).

Psychological theory on shame is best understood when compared with guilt, a related but distinct emotional construct (Gilbert, 2003; H. B. Lewis, 1971; M. Lewis, 1995; Tangney & Dearing, 2002). Both shame and guilt are characterized as self-conscious emotions related to situations where one feels negatively evaluated. However, they are notably different in relation to the focus that accompanies them. Whereas shame involves a negative focus on oneself, the experience of guilt causes one to focus on specific actions (Tangney & Dearing, 2002). As put by M. Lewis (1995), shame "encompasses the *whole of ourselves*" (p. 2, *emphasis* in original). Whereas guilt might motivate corrective actions in relation to an individual's failure to meet a certain expectation, shame directs the focus toward the perceived inadequacy of the global self.

Literature is divided on how individuals are motivated to behave following shame experiences. The pervasive and dominant view is that individuals are motivated to hide themselves in avoidant behavior or to defend themselves through anger responses (Gilbert, 2003; M. Lewis, 1995; Tangney & Dearing, 2002). From this perspective, shame is an emotional construct that facilitates maladaptive outcomes that work against meeting the needs of the self and possibly others (Hennigar & Harris, 2014; Tangney & Dearing, 2002). Other scholars, however, view the experience of shame as a phenomenon that is more dynamic in mediating an individual's assessment of failure and identity and suggest that shame can also facilitate reparable outcomes (de Hooge et al., 2011; Hennigar & Harris, 2014; Leach & Cidam, 2015). We suggest that the discrepancy between these two positions might be connected to the nuanced ways in which shame is understood across different studies. In this study, we acknowledged both perspectives on shame, recognizing the general consensus that shame mediates generally maladaptive behaviors when the emotional experience is connected to a global, fixed, and inadequate sense of self.

2.2 | Shame as influenced by sociocultural expectations

We frame the sociocultural nature of shame in two ways. First, the emotional experience arises from a perceived threat to social connection and broadly encompasses the interaction between a society's expectations of an individual and the individual's emotional response to these messages (Brown, 2006; Scheff, 2003). Second, individuals are actors who take on roles in coproducing social expectations that contribute to shame within themselves and in others. McLean and Syed (2015) provide a useful master narrative framework to explore the link between individuals' lived experiences and sociocultural expectations and to capture the interplay of cultural and personal dynamics during identity development. They defined master narratives as "culturally shared stories that tell us about a given culture, and provide guidance on how to be a 'good' member of culture" (p. 320). Personal narratives of identity are, thus, developed in negotiation with master narratives. By understanding how these master narratives are constructed by White male engineering students, we can better understand how such cultural constructions interact with individual shame experiences of engineering students as well as the shame experiences of other engineering students affected by these master narratives.

2.3 | Academic and organizational shame

We distinguish professional shame from two other related but distinct constructs that are established in literature: academic shame (Turner et al., 2002; Turner & Husman, 2008) and organizational shame (Daniels & Robinson, 2019). Turner and colleagues have highlighted academic shame as an emotional experience that occurs when students fail to meet expectations in the context of learning and have explored how they regulate their learning strategies amid such failure (Turner et al., 2002; Turner & Husman, 2008). Consistent with our framing, they defined shame as an emotional experience that is related to perceived failure. They also noted that the shame experience is marked by an individual's attribution of the failure to an inadequate whole self. However, the clear focus of their work is to explore how shame interacted with the individual learning and motivational gains of students as connected to academic performance. Such a focus is related to Pekrun's (2006) concept of shame as an achievement emotion or "emotions tied directly to achievement activities or achievement outcomes" (p. 317), which has characterized the framing of how shame has been studied in educational research (Paoloni et al., 2014; Tempelaar et al., 2012; Villavicencio, 2011). While we are not aware of engineering education studies that have explicitly investigated shame, we do note that extant research on emotions in engineering domains are aligned with Pekrun's (2006) framework of achievement emotions (Atiq, 2018; Kellam et al., 2018; Villanueva et al., 2018).

In this study, we recognize the role of academic activity in processes that facilitate professional identity development. However, our attention to how shame experiences interact with academic achievement is salient insofar as such episodes are salient to the individual's processes of considering their global identity in the professional domain of engineering education. Rather than examine the shame experience as something that mitigates or facilitates high academic performance, we investigate how shame interacts with the individual's implicit and explicit processes when considering the question "Who am I in this engineering (i.e., professional) context?"

Daniels and Robinson (2019) defined organizational shame as a "painful emotion that arises when an employee evaluates a threat to the self when he or she has fallen short of an important standard tied to a work-related identity" (p. 3). Similar to our conceptualization of shame, Daniels and Robinson (2019) connect this phenomenon to both psychological perspectives of the intrapersonal experience and sociological features of what might interact with and coproduce expectations related to individual shame experiences. In addition, they view shame as connected to individuals' identities. Our framing of professional shame is distinct from organizational shame in that we examine the context of environments that connect individuals in a specific professional group (e.g., engineering) rather than an organization. Our aims are similar to that of Bond (2009) who investigated patterns of shame within the professional domain of nursing education. While the intrapersonal experience of shame might have a consistent characterization across multiple contexts, the socially constructed expectations are categorically different when an individual is viewed as an employee ostensibly working toward the aims of an organization versus a professional qualified to enact a rarefied skillset in service to a broader society.

3 | RESEARCH QUESTION AND METHODS

We designed this investigation to answer the research question: How do students psychologically experience professional shame in the context of engineering education?

To answer this question, we used interpretative phenomenological analysis (IPA) to guide our study procedures and analytical mindsets. IPA is a research method that enables investigators to extensively examine the personal, lived experiences of individuals in relation to particular phenomena (Smith, 1996; Smith et al., 2009). In an IPA investigation, researchers are theoretically informed regarding the particular phenomena, but through the interpretive processes that we describe in the subsections below, they focus their analytical gaze on participants' lived experiences. Furthermore, IPA seeks to develop knowledge claims that are idiographic or focused on developing knowledge through insight that is found in that which is particular rather than nomothetic or focused on that which is broadly applicable (Smith et al., 2009). Because the goal of IPA is to develop idiographic findings through mindful processes of interpretation, the analytical work required for each participant in a study is extensive (Huff et al., 2014; Kirn et al., 2019; Smith et al., 2009) and, thus, IPA studies contain a small sample size.

Furthermore, in IPA studies, investigators develop contextually robust claims through in-depth, case-based analysis. Given the highly personal nature of how individuals experience shame, IPA was a methodological framework that best supported our capacity to answer the research question. In the following subsections, we elaborate on our investigative processes and explain how such procedures served to uphold our methodologically grounded commitment to answering the research question (Huff et al., 2020; Walther et al., 2013). All study procedures were approved by the institutional review boards of the two universities involved in the study.

3.1 | Institutional contexts of investigation

We recruited participants from two institutions: a medium-sized, teaching-focused, private university that is religiously affiliated and a large, research-focused, public university. The institutional contexts of the investigation were similar in two ways: (1) Both engineering programs were established relatively recently in relation to the histories of each university and (2) both institutions were predominantly White institutions (PWIs) located in southern United States. However, study participants were not necessarily local even on a regional basis to the respective universities.

The two institutional contexts differed in other ways that bore relevance to participants from each university. The teaching-focused, private university is a religiously affiliated Christian institution that identifies as a liberal arts university. Religious activity imbues the typical student experience, and accordingly, participants indicated an institutional priority on their development as whole persons. Furthermore, participants from the teaching university had interacted with their engineering professors for multiple courses with small class sizes (10–30 students in a class); thus, the teacher–student relationship went beyond single-semester interactions. In contrast, students at the large, research-focused university tended to mentally connect professors with a single course albeit in generally similar class sizes to the teaching-focused university. However, at the research-focused university, several participants had already completed internships in contrast to participants from the teaching-focused university. These participants were generally more attentive to their future workplace roles that would occur after they graduated than the students at the teaching-focused institution.

3.2 | Sampling criteria

We aligned our participant selection with our methodological commitments to IPA. To generate insight that captured important contextual and idiosyncratic nuance, we sought to probe phenomena that were shared among participants within a homogeneous social group (Smith et al., 2009). However, we intentionally differentiated according to institutional context, employing extreme sampling (Flyvbjerg, 2006) between these two generally dissimilar institutions to comprehensively study how shame manifests in engineering programs.

We recruited traditional, full-time students majoring in electrical, computer, or mechanical engineering (degree programs present at both institutions) who identified as White and male. Participants were at least third-year undergraduates but not in their final year of education to ensure that participants had a consistent level of socialization in their identities as engineering students and had completed multiple core courses in their programs. We refrained from

selecting students in their final year as graduating students may be more attentive to their future career identities (Huff, Smith, et al., 2019; Jungert, 2013).

3.3 | Recruiting procedures

We recruited potential participants through a study interest survey sent to students at both universities. The survey asked respondents to identify their major, gender, race, and interest in participating in an interview. We interviewed five participants at the teaching-focused university and four participants at the research-focused university, all of whom fit the study criteria, and provided a $35 gift card as compensation. For each participant, we provide the pseudonym, majors, and institutional affiliation in Table 1.

3.4 | Data collection

We used an unstructured interview with consistent talking points to elicit participants' personal, lived experiences of shame in their engineering education domains. We did not initially disclose that the study was related to *shame*, a word that is emotionally charged and susceptible to being misunderstood in relation to our conceptualization of the construct (Tangney & Dearing, 2002). Rather, we opened by asking how participants understood their overall identity: "When you think about who you are as [name], what is really important to being you?" The question helped us understand the individuals' global, or holistic, sense of identity, after which we were able to elicit the salience of their roles as engineering students without asking them directly. We then focused on expectations they felt in domains that were most relevant to their identities. If they did not express their engineering education domain as being salient to their global identities, we directly asked them what they felt was expected of them as engineering students.

As participants described particular episodes, we prompted them to provide experiential (vs. generic) reflections of how they experienced shame in particular moments. We then followed up by asking how others perceived their response in those moments to gain insight into their behavioral responses to the shame experience. At the end of the interview, we provided an accessible definition of shame and gave participants the opportunity to comment on whether they felt that they had spoken to this phenomenon. In addition, in interviews conducted at the research-focused university, participants were asked about somatic features (e.g., taste, smell) of experiencing shame. Finally, because we had investigated such a personal and sensitive phenomenon, we debriefed participants by mentioning available counseling resources. We have included the goals that guided our interview process along with example questions in the online supplemental document associated with this article. Interviews ranged from 63 to 103 min with an average of 81 min.

3.5 | Data analysis

Consistent with the overarching goals of IPA (Smith, 2011a), we analyzed data from the interview transcripts to deconstruct patterns of how participants experienced shame in their professional domains. Benjamin and Kanembe (second and third authors) provided detailed analysis of all of the interviews with supporting contributions from James (first

TABLE 1　Summary of participants

Pseudonym	Engineering major	Institution
Bill	Electrical	Research
Daniel	Computer	Teaching
Keith	Mechanical	Research
Martin	Mechanical	Teaching
Maxwell	Mechanical	Teaching
Mickey	Mechanical	Teaching
Rocky	Computer	Research
Roger	Mechanical	Teaching
Sam	Mechanical	Research

author). Our approach guided us to maximize our attention toward the accounts of participants on their own terms and to cautiously question participants' accounts beyond a superficial view of their descriptions. Our analytical interpretive processes focused both on developing idiosyncratic understandings of each participant's individual shame experiences while also organizing our findings to reflect coherence across the group (Smith et al., 2009).

We began with ensuring that each interview transcript reflected a robust capture of the audio file and also maintained participants' anonymity. We then used three analytical lenses to expand our understandings of how a particular participant experienced shame. First, we annotated the text to describe how a participant understood his experience in his own terms. In documenting descriptive annotations, we were able to record salient features of a participant's account and reflect what he considered to be important. Second, we analyzed the same text to annotate linguistic features to understand how the participant's language colored the meaning associated with the textual content. For example, we might question why a participant laughed after a certain statement or described a first-person experience in the second-person voice. We then documented conceptual annotations for the same text. At this point, we cautiously allowed our prior understandings of professional shame to guide us into articulating questions that we might ask throughout a participant's account.

Finally, after noting these three layers of annotations, we reexamined the transcript along with our prior annotations and documented emergent themes, which were statements that summarized the psychological patterns of a particular excerpt in the transcript. We then organized the many emergent themes in the form of a conceptual map and developed themes for each participant. After analyzing a single participant in this manner, which is documented in greater detail in our previous work (Huff et al., 2014), we repeated the analysis with the next participant. After analyzing all participants' interview transcripts, we organized the themes into four major categories to demonstrate coherence (Walther et al., 2013) and offer a detailed picture of how participants experienced and responded to shame in their professional domains.

3.6 | Relationship of theory and data in interpretation

We previously defined the operational construct of professional shame as a way to frame the phenomenon examined in this study. However, in the findings, we were careful to reflect both the tension and alignment that we interpreted between the individual, lived experience of professional shame and our theoretical framing of the phenomenon (Huff, Okai, et al., 2019; Smith et al., 2009). To elaborate on this process of interpretation, we reference Geertz's (1974) claim that "rather than attempt to place the experience of others within the framework of [theoretical conceptions of self], ... we must ... view their experiences within the framework of their own idea of what selfhood is" (p. 31).

In line with Geertz's thinking, although theoretical understandings of shame served to hone our sensitivity to the construct during data collection, we maximized the voices of participants in the analysis and encouraged these idiosyncratic experiences to dialog with our theoretical understandings of shame. In the findings, we were selective in providing excerpts that capture the complex picture of how professional shame was lived by participants. To understand how these excerpts relate to the central focus of professional shame, we relied on Smith's (2011b) concept of the *gem*—that which "stands out" and "shine[s] light on the phenomenon" as well as "demands attention and prompts further analytical work" (p. 7). A *shining gem* as Smith (2011b) calls it would be Martin's quote in the epigraph: professional shame illustrated in a contextual depiction consistent with theoretical understandings (e.g., emotionally rich, hiding, attributing to the whole self). Other excerpts might be better described as *secretive gems* (Smith, 2011b), which illustrate important features of the phenomenon but require more analytical dialog to make sense of participants' experiences. For example, in Subtheme 2.b, Bill provides experiential clarity on the felt expectation of needing to be seen when he studies. While the excerpt does not highlight readily apparent emotional features of his experience, it does give definition to the identity threat that participants felt when they were not seen as hard-working. Thus, a participant's account may not fully contain the professional shame experience, but it sheds light on the holistic patterns that were found across the corpus of data.

4 | FINDINGS

The findings are organized to demonstrate a cycle of patterns that reflect how participants experienced shame, which are listed in Table 2. Theme 1 illustrates how participants established their personal, global identity in engineering education as a negotiation. Participants identified as engineering students yet sought to distinguish themselves as whole persons. Theme 2 examines how participants felt threatened in relation to their identities when they described failing to meet socially constructed expectations in their professional domains, thus experiencing a threat to their global identities. Theme

TABLE 2 Themes and subthemes

Theme 1: Negotiating the global identity in the professional context

Subtheme 1.a: Aspiring to the worthiness of being an engineer

I always felt like as an engineer I need to live up to the name and make the world recognize how important engineers actually are and what we can do so. (Sam)

Subtheme 1.b: Distinguishing the global identity from the prototypical engineer

Someone says, "Of course you're an engineer." Then to me, what they're saying is you fit the engineering stereotype, which I don't particularly want to be associated with. (Maxwell)

Theme 2: Encountering shame in threats to the global identity within the professional domain

Subtheme 2.a: Encountering threats to identity in intellectual performance

I'm seeing my friends are doing great on these [mechanical engineering course] tests, and I really struggled with that class. My teacher ... kind of brought me down. (Sam)

Subtheme 2.b: Encountering threats to identity in the performance of work ethic

I think that comes out in the form of ... desiring time to myself—not productive time—but just bored, lazy time, which I don't think has a place especially as a student who has things to get done. (Roger)

Subtheme 2.c: Encountering threats to identity in perceived inadequacies in the workplace

And there is that little nagging voice at the back of my mind that's like, "You haven't done anything with it yet, so who says you ever will, and why does that mean it's important?" (Keith)

Subtheme 2.d: Feeling social disconnection as targets of upward comparisons from nonengineering majors

It's just kind of a feeling of, "Oh no. They're going to have expectations of me to be much smarter than I am," ... I don't like to set high expectations, because I don't like causing people to feel disappointment. (Martin)

Theme 3: Lending credibility to the shame experience through maladaptive responses

Subtheme 3.a: Hiding from the shame through avoidance

When I'm sitting I'll slouch down a little bit more, and I'll close off my shoulders a little bit more, just because I want to avoid [the professor's] attention for a couple days. ... Classic technique. (Martin)

Subtheme 3.b: Rejecting the shame experience by not acknowledging the emotion

You just gotta get over it, or else you're going to make yourself miserable forever. (Bill)

Subtheme 3.c: Externalizing the shame experience

[A fellow classmate] was not, in any way, shape, or form, fit to be an engineer from day one, in my opinion, but just would not take care of anything. Would not do any of the work. Would not do anything. (Daniel)

Theme 4: Repairing the self through cognitive reconstructions and social connections

Subtheme 4.a: Attributing failure to behavioral choices rather than the self

It's obviously unacceptable to do a lot of the things that I did, and so as a result I learned and I'm grateful looking back on it. (Rocky)

Subtheme 4.b: Reducing the identity centrality of social expectations

I ended up quitting the lab, because I decided that I wasn't working on things I wanted to do anymore. ... As soon as I did that, my grades, my social life—it improved ... there wasn't that weight anymore. (Keith)

Subtheme 4.c: Restoring social connection amid shame

I've just thrown in a question and asked them about it and usually they have the same feelings I do. ... It tones down that feeling of inadequacy because if more people feel like that, then it's a normal stage that we're going through, so it's not inadequate if it's what it's supposed to be. (Mickey)

3 shows how participants responded to these identity threats in ways that were likely maladaptive to improving their painful experiences. By hiding, disengaging from the emotion, or externalizing their experience to others, they elevated the socially constructed expectations that they felt they had failed to achieve and, consequently, diminished their own identities and, in some cases, the identities of others. Yet as shown in Theme 4, participants also employed reparative strategies by reframing their shame experiences constructively or by connecting with others to make their shame known.

4.1 | Theme 1: Negotiating the global identity in the professional context

When participants considered their identities in the context of their professional preparation, they approached their environments with postures of negotiation. On one hand, their participation in the engineering domain validated a

global sense of worthiness in understanding who they were as individuals. Consequently, they experienced shame when they perceived themselves as failing to meet expectations socially constructed within that domain.

On the other hand, when they considered the stereotype of what it meant to be an engineering student, participants sought to distinguish how they stood apart from how others perceived their professional identities. Thus, they forged a fraught relationship between their personal identities and the roles they played in their professional domains as engineering students. Such negotiation when forming and maintaining their identities established the foundation for experiencing threats to their identity for not being enough of an engineer—or for being too much of one.

4.1.1 | Subtheme 1.a: Aspiring to the worthiness of being an engineer

In many regards, participants understood their roles as engineering students to reflect the best versions of who they were as individuals. In Sam's case, being recognized as "an engineer" meant that he could be understood by others as someone who—through a combination of tenacious work ethic and intellect—could contribute value to "the world." His engineering degree signaled something about his central, personal identity. As he stated:

> So I feel a source of pride when I'm hanging out with my friends and they're like, "Oh, what's your major?" And I'm like, "Mechanical engineering." Someone says "Wow, mechanical engineering. Wow, this guy knows what he's talking about." ... I always felt like as an engineer, I need to live up to the name and make the world recognize how important engineers actually are and what we can do. (Sam)

Thus, Sam's participation in engineering was characterized by a need to "live up to the name" of a profession that he and others deemed important to society, a viewpoint shared by the other participants regarding their identities as engineers. For example, Bill, an electrical engineering student, stated, "To be an engineering major ... requires a special kind of intelligence—the kind of knowledge you don't always find everywhere." His engineering major gave him an identity that signaled to others how was capable of producing a "special kind of intelligence."

Other participants connected with a similarly elevated sense of identity. For example, Mickey stated, "I have a feeling that despite [upper-level courses] being hard, I'm going to start feeling like an engineer, which is what I really want." And as stated by Keith: "You have to prove that you can really be an engineer before you can start really learning engineering." Thus, the arduous journey of being an engineering student provided participants with an important sense of worthiness. They could unearth a version of themselves that they aspired to be, particularly in relation to others.

4.1.2 | Subtheme 1.b: Distinguishing the global identity from the prototypical engineer

Although participants perceived their engineering roles to validate them as individuals, they distinguished their global and holistic identities from the prototypical engineering major. While Sam aspired to an overall sense of worthiness through his role as an engineering major, he also stated: "I like to make sure people know me for me, and I like to sometimes go a couple of days or two not talking about engineering ... so people don't classify me as the engineer." He desired others to understand he could build relationships and, accordingly, he sought distance from his perceived identity as an engineering student.

Some participants described their core identities as existing beyond their professional roles. Maxwell, a mechanical engineering student, described how he did not want to "fit the stereotype that comes with engineering," contrasting his extroversion and pursuit of physical activity with his perception of engineering students as introverted and sedentary. However, allowing others to discover that he was an engineering major validated his global sense of identity as someone who was interpersonally skilled:

> If somebody ... asks about my major and then says, "Wow—I'm surprised," or maybe they don't verbally say that, ... I think that, to me, it's a badge of honor almost. Like, I've been involved in a degree that typically takes people's social lives out of the picture, and I haven't let that be the case. (Maxwell)

In general, participants were motivated to distinguish themselves from what they perceived to be a prototypical engineer. For example, Bill stated, "There are some people [engineering majors] that maybe all they do is study math and physics, and they're always here. But me, for instance, I'm in [a student organization]. I do [music] stuff." Keith also sought to differentiate himself from other engineers through his ability to balance interests, stating, "I know many people that are equally or far more intelligent than I am but maybe lack that balance a little bit. That's something that I think kind of differentiates me. I can be a numbers man, but I can also be an [artist]."

Participants had a conflicted relationship with their role as engineering students, which they negotiated to understand who they were as individuals. While engineering contained some features of identity that participants aspired to—being creative, innovative, problem solvers—they also wanted distance between their individual identities and what others expected of them as engineering students. Their participation in engineering was interwoven in the fabric of their global identities, defining the parts of themselves that they aspired to bolster and providing a foundation from which they could seek individual distinction.

4.2 | Theme 2: Encountering shame in threats to the global identity within the professional domain

Participants encountered threats to their global identities as they negotiated engineering student roles. The threat they felt from others was not neatly defined as a threat to an engineering component of identity. Rather, participation in engineering education provided a complex framework for understanding who they were as holistic individuals and they felt identity threats to their whole selves. When the identities they hoped to achieve as engineers were threatened by messages of inadequacy in their professional domains, they experienced shame. In addition, when their roles as engineering students threatened their interpersonal environment, they experienced shame.

Within their professional domain, participants felt threats to their global identities when they were explicitly or implicitly devalued in relation to their intellectual performances and when their overall work ethic was challenged. Furthermore, participants contended with threats to their identities when imagining themselves inadequate in their workplaces. Finally, participants perhaps ironically felt a threat to their overall identities when receiving validation from their nonengineering peers.

4.2.1 | Subtheme 2.a: Encountering threats to identity in intellectual performance

Participants held themselves to high standards in intellectual tasks, and nearly all discussed instances when they failed to achieve their desired results. Martin described the painful experience of receiving a D in a foundational course, which would preclude him from taking later courses: "I went back on the page and then re-clicked it. ... It stayed a D. I just kind of got a little pit in my stomach and was like, 'Oh no.'" He also recounted how as an engineering major he was assumed to be "smart," which invoked self-criticism and social comparison in relation to his brother: "My brother is ... just purely much smarter than me. ... Whenever I hear people say, 'Oh, you're smart,' I think, 'Well, I'm not on my brother's level.' And it's kind of like, 'Are you sure you're talking about me?'"

Others described similar experiences of failing to achieve their internal standard of high intellectual performance. Sam stated, "I'm seeing my friends are doing great on these [mechanical engineering course] tests, and I really struggled with that class. My teacher ... kind of brought me down." Daniel elaborated on submitting what he viewed to be an inferior prototype to an external stakeholder in a lower-level design course: "Just turning in the crap that I turned in—I was in no way satisfied with it, and I'm pretty sure that [the instructor] was not, and I'm pretty sure that [the external stakeholder] was not."

Participants perceived that their failure to achieve their standards from different sources of information such as objectively low scores on academic tasks, direct comparison to peers, or perceiving others' reactions to their work. However, each case was connected to social comparison. Even though Martin had achieved a low score, he had elsewhere described how his smartness was a standard that he struggled to accept in comparison to his brother. Daniel contrasted his external stakeholders' reaction to his design prototype with how he had responded positively to prototypes of other students. In addition, Sam's shame was heightened by the experience of perceiving his peers doing well in academic tasks.

Such social comparisons supported how participants felt threatened in relation to their intellectual identities but they were not always supported by observable evidence. Roger, a mechanical engineering student who was hired as a tutor, stated, "I think it [course content] makes sense to a lot of my peers … that's part of what makes me feel inadequate … it makes sense to all of these people who I'm with on a regular basis while I seem to be struggling more than I should be." His sentiment captured a pattern found among others where an inferior intellectual performance was imagined simply because of how other students *appeared* to be performing well. In other words, participants not only compared themselves to how others actually performed based on grades, they also compared themselves to others' *performance* of their intellectual performance.

4.2.2 | Subtheme 2.b: Encountering threats to identity in the performance of work ethic

Participants held themselves to the standard of demonstrating a strong work ethic to their engineering peers. For example, Sam described his felt expectation of never missing a class: "People expect me to always be at the top of my game. And if I miss one class, people will [say], 'Hey [Sam], where are you?' … I kind of have that expectation from my fellow students." Bill described how work ethic was a core internal standard that he felt in navigating everyday life as an engineering student: "I don't always live up to my own expectations. I like to think that I would be [in the engineering building] every day and would spend hours every day trying to study and learn, but ultimately, it doesn't always come down to that." These excerpts reflect participants' awareness of the palpable expectation that they approach their tasks with a dedicated work ethic in ways that could be seen by their engineering peers.

Roger's account illustrated how failing to demonstrate a strong work ethic might interact with an individual's core spiritual and moral identity. Early in the interview, Roger stated, "Scripture says, like, [to] do everything that you do as if you're working for the Lord, and I think that carries into our classes and into engineering." Roger further connected his desire for rest to promoting interests that in his view were particularly selfish:

> I think that comes out in the form of being lazy and being passive toward people and desiring time to myself—not productive time—but just bored, lazy time, which I don't think has a place, especially as a student who has things to get done … to just sit on the couch or take a nap when you're not even tired, from what I observed, can be a common problem. (Roger)

Roger's understanding of being a good individual in an engineering domain involved a persistent display of work ethic.

Overall, participants connected their internal sense of work ethic to a core value that they were expected to put on display within engineering education domains. They perceived the rigidity of these standards from their engineering peers, their professors, and their own internal compasses of morality and failing to achieve such expectations could give rise to threats to their identities as individuals with a dedicated work ethic to their professional tasks.

4.2.3 | Subtheme 2.c: Encountering threats to identity in perceived inadequacies in the workplace

Participants also described their fears that, despite intellect and work ethic, they would fail to measure up as an engineer. As put by Keith: "There is a little nagging voice at the back of my mind that's like, 'You haven't done anything with it [engineering training] yet, so who says you ever will?'"

All participants from the research-focused, public university and two from the teaching-focused, private university demonstrated a pattern related to shame when they encountered or in some cases imagined their inadequacies in the workplace. Although participants connected the demand of their educational activities to the elevated status they ascribed to as engineers, they also questioned if their coursework would prepare them for the workplace. They feared that one day, they would encounter a direct threat to their global identities.

However, this fear was not simply set aside for future moments. The messages of inadequacies from the workplace entered their lived experiences when pursuing internships. Sam illustrated the painful experience of learning that he was not selected for an internship:

> I check my phone. I see an email: "Sorry we couldn't offer you the job." ... I've prepared my interview. I toured. I did networking, and I don't get this job. It's disappointing. I'm like, "Why am I not good enough? What else could they want? Who was better?" Things like that you start thinking. Insecure. I'm wondering what I did wrong. I'm wondering what they don't like about me. You know, it starts to bother you. How can I be better? ... This is what I wanted to do. And it doesn't work out. It's crushing, depending on how much effort I put into something. So it sucks. (Sam)

Sam had painfully experienced rejection from his desired work opportunity. He recounted the experience with a linguistic pattern that indicated the difficulty and the internal questioning that he experienced in receiving the news about the outcome of his job search. Elsewhere, he described his emotional reaction as follows: "I was angry. I was angry and sad. ... They don't want you, so it's tough to deal with. Definitely shaking, angry, sad."

In looking to his future prospects, Sam was concerned that he would not be prepared for a professional role that was important to his core identity: "I've taken all these classes, but I really still don't really know that much in regards to engineering. ... I stress out about that—not knowing—not being able to design some stuff that I see that [entry-level engineers] are out there doing."

Although Sam most evocatively portrayed feeling threatened by imagined inadequacies in the workplace, others also demonstrated poignant feelings of threat regarding their envisioned transitions between their education and their potential employments. Daniel, Mickey, and Bill each expressed the noticeable disconnect that they felt between their theoretical coursework and their envisioned roles in the workplace. Mickey, when he elaborated on how he "feel[s] inadequate stuff," stated, "Until I reach the point of—I feel like I can design something—that is the point of when I feel like an engineer. ... So with my theoreticals, I know those equations, I know those processes, but can I apply them to design?"

Participants then experienced professional shame not only in the immediate messages related to their current identities. When concerned that their engineering education was not adequately preparing them for their roles, they feared a threat to their would-be identities in the engineering workplace.

4.2.4 | Subtheme 2.d: Feeling social disconnection as targets of upward comparisons from nonengineering majors

Participants felt a powerful social disconnection from nonengineering peers when they heard statements in which they were the target of an upward comparison. For example, in the opening quote of this article, Martin illustrated the phenomenon of feeling emotional distress after a nonengineering peer called him "smart," stating, "I don't like to set high expectations because I don't like causing people to feel disappointment. I like people to be happy, you know? And disappointment is the opposite of happy." By being labeled as "smart," he felt a threat to his capacity to find social connection in his interpersonal environment—or for the people around him "to be happy" with him.

As an academic tutor, Roger described his emotional response when he did not know how to help a nonengineering student: "The first thing in my mind that comes up is just a panic and ... un-confidence that I'll be able to solve this [problem] the correct way. ... There's definitely a pride factor that makes me want to seem like I know what I'm doing and not fail them in any way or let down their confidence." Elsewhere, he established his felt expectations from nonengineering peers: "I think there's an expectation of—superintelligence that I don't think exists (laughs)." Thus, Roger described a complex reaction to his struggling to help the student who had come to him for tutoring. On the one hand, he felt validated related to preserving his identity via the intellectual performance of tutoring. Yet he also felt a relational need to not "fail" the student or "let down their confidence." This latter reason suggested a sense of burden among his interpersonal relationships in being seen as someone who possessed "superintelligence."

Others identified a similar mixed sentiment of validation and discomfort when being labeled as an engineering student. When Sam's friends were impressed with his work, he described their view of him as a "burden on my shoulders." Bill, Keith, and Daniel also discussed various instances of inwardly navigating the ostensible compliments, which were connected to engineering stereotypes, from nonengineering peers or family members. Likewise, they were caught in between appreciating others' recognition of their intellectual performances and feeling poignant discomfort at being socially isolated from others because of such recognition.

Not all participants felt the potency of emotional distress that Martin voiced when receiving validation from nonengineering others. However, each participant discussed in this subtheme felt some discomfort and disconnection from their nonengineering peers. When they were seen as meeting the exceedingly high expectations of what it meant

to be an engineering student, they felt seen as "superheroes." However, beyond the façade of the "smart" engineering student were individuals who desired—and in those moments were not receiving—social connection.

4.3 | Theme 3: Lending credibility to the shame experience through maladaptive responses

The painful experiences that brought shame to participants motivated each of them to respond to the phenomenon. Here, we elaborate on three patterned responses that seemed maladaptive because of the ways in which they isolated participants from the social world and hindered their recovery from the dysphoria of shame. First, participants sought to mitigate their experiences of shame by hiding from others through avoidance. Second, they sought to disengage from acknowledging the negative emotional phenomenon they experienced. Finally, participants sought to hide through a reactionary defensiveness by externalizing the shame experience to others.

We consider such responses to be maladaptive to the individuals because they served to lend credibility to the perceived expectations that participants felt they failed to achieve. If a participant felt threatened due to intellectual performance, hiding or disengaging from the negative emotional experience served to reinforce the perceived standard that he must be seen as a high intellectual performer due to his participation in engineering. If a participant felt threatened in his identity due to being seen as lazy, targeting others through defensive mechanisms also served to give prominence to the standards by which he felt judged. We elaborate on these patterns in the following subthemes.

4.3.1 | Subtheme 3.a: Hiding from shame through avoidance

Participants tended to avoid social situations that could expose their shame to others around them. They would attempt to hide their failure in ways that only perpetuated the phenomenon. For example, during a research internship, Keith encountered multiple instances of failing to perform as expected in his work position:

> When one of the team leaders or a supervisor of some level would ask me why something had not been done yet—I knew why it hadn't been done—because it hadn't been done because I didn't want to do it yet. But it was kind of me choosing and starting to find technical or at least workplace-acceptable reasons why: "It's just taking longer than I thought it would; I need more information." … Excuses. It was just a lot of me trying to pretend I was on top of things, but in reality, I was very intentionally putting myself behind. (Keith)

In this excerpt, Keith sought to avoid judgment for not completing a task by cloaking his explanations for the avoidance in "workplace-acceptable reasons." His account demonstrated a keen self-consciousness. Although he did not feel personally connected to his work-related tasks, he also did not want such an identity-related disconnection to be discovered by his colleagues. Likewise, each participant explicitly demonstrated at least one pattern of seeking to avoid scenarios in which their perceived failure could be discovered by others in their professional domains.

Martin similarly hid his sense of failure by avoiding an instructor after a low performance on an exam: "I just kind of felt like, 'Oh, well he spent a lot of time preparing this lesson for this class … kind of upset at myself for not picking up on what he was saying." When Martin felt such a dissonance in the relationship between him and his instructor, he sought to avoid the instructor in classroom interactions: "I'll slouch down a little bit more, and I'll close off my shoulders a little bit more—just because I want to avoid his attention for a couple of days." Martin and the other participants desired to achieve both goals related to work-related performances and goals related to interpersonal relationships. Their performances in professional domains mediated some aspects of their interpersonal relationships with these same people (supervisors or educators) in these domains. Therefore, while seeking help from the instructor might have remedied both Martin's learning and relational goals, he responded to the painful experience of a low intellectual performance by isolating himself from the instructor.

However, participants' avoidance was not only directed at those in positions to evaluate them. They also sought to avoid the discovery of failure by engineering peers. Bill discussed how he would "say something generic" when asked a question related to electrical engineering concepts to hide that he did not have an answer. Roger relayed how he interacted with one of his close friends, another mechanical engineering major, whom he perceived to be performing well in a course where Roger was struggling:

You definitely see [my friend] make a joke and me pretend that I didn't hear it because I'm trying to pay attention to the professor's quotes. ... Or me, in a way, pretending to be studious or involved [so] as to not talk to [my friend] who's next to me. ... Just silence. (Roger)

Avoidance provided participants with a short-term gain in easing the pain of the shame experience. By implementing strategies that hindered others' discovery of their real or perceived failures, they could experience failure without an audience. However, in each scenario, each participant was an audience unto himself. They provided harsh judgment toward themselves that they similarly feared would come from others in their professional domain. In doing so, they gave prominence to the standards by which they felt judged and raised the threat to their identities in failing to meet socially constructed expectations.

4.3.2 | Subtheme 3.b: Rejecting the shame experience by not acknowledging the emotion

When many participants encountered the experience of shame, they depicted an image of the engineering student who was motivated to "power through" (Mickey), "move forward" (Rocky), "[not] deal with it anymore" (Daniel), and "get over it" (Bill). Participants' disengagement from the shame experience is a complex pattern in that there are both reparative and maladaptive processes at work in the ostensible desire to no longer remain in a state of shame. In the next theme (Theme 4), we discuss reparative strategies that participants used to navigate their ways out of cyclical experiences of shame. However, in this section, we examine participants' refusal to acknowledge the negative emotional experience altogether and hide their authentic feelings of shame from themselves.

Collectively, participants found the experience of shame to be a visceral and personal experience. Some participants from the research-focused university were asked to describe the somatic features of how they felt during shame experiences. Sam described the "smell" of shame to be "just repulsive—foul—like something was rotten. Didn't want to look at it—didn't want to be part of it." To not desire shame is something that is fundamentally human—not necessarily particular to engineering students. However it is striking how to participants shame was not permitted to occupy the professional domain of engineering education. In contrast, emotional responses that yielded a sense of control to the individual—such as anger or frustration—were welcomed. Rocky described his emotional response to failing to meet expectations in his engineering coursework and his internship:

I take the emotions and metaphorically push them down into myself where I don't feel them anymore, but ... that's just so I can get through something—or it used to be ... without exploding and blowing up or breaking down into a panic attack. But then later, you can go and kind of deal with those emotions. You can go, "Okay, I feel angry or sad about this, but I'm going to take it out in a constructive way by lifting weights or hitting a racket ball." (Rocky)

Rocky demonstrated a complex response to experiencing shame. On the one hand, he sought to quickly disengage from the experiences by "push[ing] them down" to maintain emotional stability while completing tasks. On the other hand, Rocky returned to acknowledge the emotion, but even when returning to the negative experiences of failure, the emotions were not something for him to reflectively process but rather something that he needed to "take ... out" through physical activity. Participants desired to process their shame in ways that they could maintain a felt sense of control as one who was putting something out into the world rather than receiving judgment for failure.

4.3.3 | Subtheme 3.c: Externalizing the shame experience

At times, the experience of shame motivated six participants to redirect their pain to others. Specifically, they devalued those who in their view had caused them to feel shame. In describing his experience of failing to demonstrate a successful design prototype, Daniel attributed the failure to his partner on the team, stating: "The [person] I was paired with was not—in any way, shape, or form—fit to be an engineer from day one ... just would not take care of anything, would not do any of the work, would not do anything." We note that he, Daniel, made sense of his own failure by

attributing the failure to not only another person's actions but also to their overall identity by stating how the person "was not ... fit to be an engineer."

However, shame was not only redirected at those who were perceived as responsible for failure. In Roger's case, he was motivated to direct shame toward a good friend who he felt was outperforming him. When Roger was silent toward a friend who would make jokes at the beginning of class, he described the motivation for his behavior, stating: "Part of it might be jealousy that he was able to do that [assignment] so well and I didn't. ... It's almost that I have this defensive position that doesn't want to let him have a good day if I'm not having a good day." Roger connected his silence toward his friend to a "defensive position" that was working against his friend. In Roger's view, through silence, he was reciprocating interpersonal pain toward his friend from whom he felt a threat to his identity in relation to intellectual performances.

Five participants highlighted a pattern of externalizing shame toward engineering professors. These participants explicitly felt devalued by the professors after receiving feedback on academic tasks. Some then redirected their shame back to the professors. The negative judgment that accompanied the shame varied according to the individual participant. Rocky felt a distinct lack of respect toward an instructor because of their leniency in grading policies. He viewed that such leniency diminished not only his own intellectual performance but also the reputation of all engineering graduates. Maxwell, referring to a time that he felt chastised by an instructor after asking for help on an assignment, discussed the conversation that he had with his friend after leaving the instructor's office:

> [We] basically said, like, it's just ridiculous that he expects us to be this far ahead when it's not really any consequence to him. And we did make a comment on, "Well, he hasn't graded a couple of our labs already—and so how can he expect us to be this—?" (Maxwell)

When Maxwell encountered a threat to his identity in relation to his instructor's expectations of work ethic, he and his friend started to devalue the performance of their instructor's work ethic.

Externalizing the shame experience toward other individuals did provide a short-term sense of control to participants in times where they felt most vulnerable to threat. Yet by externalizing shame toward other individuals, they did not recover from their own shame. Rather, by redirecting shame toward others, participants upheld the social expectations by which they felt judged. In so doing, it is possible that shame was spread—not transferred—to others in their environment.

4.4 | Theme 4: Repairing the self through cognitive reconstructions and social connections

After the initial and sometimes persistent experience of shame, some participants employed mechanisms that restored their identities to themselves and made them feel more connected rather than isolated to the interpersonal world within their professional domain. Specifically, participants cognitively reconstructed the event of failing to meet expectations in three ways. First, they shifted the focus of their failure to behavioral choices rather than identities. Second, they reduced the felt weight of social expectations, allowing themselves to fail without feeling threats to their identities. Finally, participants stepped outside the isolation of their shame experience to socially connect with others, allowing themselves to be seen by their friends and loved ones. We elaborate on each of these patterns in the subsections that follow.

4.4.1 | Subtheme 4.a: Attributing failure to behavioral choices rather than the self

Four participants described strategies for overcoming shame experiences in ways that showed they were reexamining the situation to focus on what was done rather than on their own identities. Two participants reflected on such a shift when failing to achieve intellectual expectations. Martin described how he made sense of his performance on an exam by focusing on his conceptual misunderstandings rather than on his identity:

> I went back to the dorm, picked up the book, opened up the book, and started reading the section. I redid a couple of the homework problems again on that section but not all of them. … I just tried to rerun it all again. I didn't think, "Okay, I understood this part about it." I just went from the very basic part of it again and went through it. (Martin)

Thus, while Martin did experience powerful moments of shame in his engineering student experiences, he could also reconstruct events of failing to meet social expectations as critical for his learning. Likewise, after the initial "shock of it," Bill reframed an experience of making a failing score on a physics exam to be related to his actions as a student rather than an attack on his identity: "Once you understand that there's nothing you can do about that grade—that's just something you've done." Separating his core identity from the event of receiving a failing score on an exam motivated Bill to alter his study habits and improve his next exam score by 40 points.

In other instances, participants reexamined their work-related attitudes and habits. Rocky had experienced an overall difficult internship in his first year of undergraduate studies primarily due to his behavior, which, at the time of the interview, he considered to be immature: "I would sit with my feet on the desk while [my supervisor] was talking to me. I would shuffle cards during meetings." When Rocky reexamined his workplace performance in terms of his actions, he reconsidered how he would behave in his professional domain: "I was thrown into the fire because it's obviously unacceptable to do a lot of the things that I did, and so as a result, I learned … how I need to be before getting into the real world and have to learn those lessons at a future time." After being "yelled at" by his supervisor for his workplace behavior, Rocky reconsidered his experience as something that he could learn from and consequently improve his workplace behavior.

Participants' descriptions of how they reframed their experiences to focus on their behaviors rather than their identities indicated that they were moving to an emotional experience that resembled guilt rather than shame. While the initial incidents of failure did facilitate painful shame experiences, they gradually gave way for participants to reexamine actions that were taken (or not) and then change their behavior to meet the expectations rather than feeling threats to their identities.

4.4.2 | Subtheme 4.b: Reducing the identity centrality of social expectations

Rather than changing their behavior to achieve social expectations, some participants opted to reduce the perceived weight of such expectations, thus reducing the centrality of the standards in relation to their identities. Following the moments that Keith experienced shame during his research internship, he came to realize that his performance was linked to his lack of connection to the role:

> I found a way out of it because once I realized that I wasn't enjoying it—or I was making excuses to think it was okay—then I started to re-evaluate why I was there. And I eventually ended up quitting the lab because I decided that I wasn't working on things I wanted to do anymore. As soon as I did that, my grades, my social life—it improved because there wasn't that weight anymore. (Keith)

Although Keith resigning from his role might be interpreted as an act of avoidance, we contend that his actions in this case were a step in restoring his sense of identity. By recognizing that his work role did not fit with his global identity, he chose to leave behind his struggle against the expectations that he had avoided by making "workplace-acceptable" excuses.

In addition, Roger felt distress in his struggles with a certain engineering course, questioning his own fitness in being an engineering major. However, he came to find resolution in the course by shifting his perspective about the course content, stating, "I think just realizing that this [course] isn't all that engineering is. This doesn't define everything." Roger came to understand that his failures to perform as he expected in this engineering course did not relate to his competence as an engineer. Rather, the expectations were limited to a specific portion of his professional preparation. By reframing the expectations associated with academic failures, some participants recognized that such tasks neither defined who they are as engineers nor did they define their global identities. The way out of their experience of shame was to reduce the centrality of these expectations in relation to their identities.

4.4.3 | Subtheme 4.c: Restoring social connection amid shame

Several participants chose to make known their shame in a trusted community. Notably, Sam, Martin, and Mickey relied on calling their mother when they felt the pain of failing to achieve certain expectations. For example, when Martin encountered the threatening possibility of receiving a failing grade in a class for the first time, he reached out to make his situation known to a person he trusted:

> I called my mom, and I was completely panicking. I was a mess. I was crying because I had never failed a class before. ... My mom ... was just like, "[Martin], it's okay to fail a class. We're paying for you to be able to try your hardest in a class, and as long as you're trying your hardest, it's okay." That calmed me down a little bit. Then she just kept talking about what to do for the next semester or the next time I take the class—and how to prepare better. That got me focused, thinking, "Next time, next time, next time." (Martin)

By reaching out to his mother, Martin made known his shame to someone whom he likely trusted to see beyond the devaluation of his performances. In the conversation, Martin's mother guided him to a future-oriented perspective on how he could change the outcome, demonstrating a connection to him in a moment when he had felt alone.

Keith discussed how he sought connection with a professor whom he had deemed to be "uniquely intimidating." He elaborated on his strategy as follows: "I got to know my professor because I knew that the intimidation withheld me before. ... I talked to him every morning. ... It was after that point where I no longer felt scared of the class, and I was able to really do well." By coming to view the professor as someone who was not a threat to his individual identity, the negative experiences of the course gave way to a positive learning and relational experience for Keith. Although he did not explicitly make known his shame to the instructor, he chose to allow himself to be seen by someone whom he had once considered a threat to his identity.

Others described a heightened interpersonal bond with their classmates regarding the similarity of their student experiences, a strategy that worked against the isolating emotional labor that accompanied shame. Roger identified a bond that came through helping his peers on their work, which motivated him to likewise "get better at ... trusting other people with the work and [know] that they are competent to do it." Mickey relied on his engineering peers to directly make known his feelings of shame. He described opening up to his peers regarding his shame experiences, which alleviated his painful experience:

> I've just thrown in a question and asked them about it, and usually, they have the same feelings I do— which is encouraging because it makes me feel like I'm not alone. And it makes me feel like it's a normal thing at this point. It tones down that feeling of inadequacy because if more people feel like that, then it's a normal stage that we're going through. So, it's not inadequate if it's what it's supposed to be. (Mickey)

By talking to his engineering peers about his sense of inadequacy, Mickey overcame any perceived risk of allowing himself to be too exposed to his classmates, all of whom (as well as Mickey) were those who had helped to coconstruct the social expectations in their engineering domain. However, in making known his shame, Mickey discovered a potent remedy to his emotional experience. He learned that he was not alone and that his failures were not a signal that he was globally inadequate as an individual—they showed that he was undergoing a "normal stage" in his development. By making his shame known, Mickey reauthored the script that he and his engineering peers followed. Within that moment, they were no longer elevating professional expectations that would devalue one another. They had instead found a communion in their shared feelings of inadequacy and in doing so had learned that they were human—not inadequate.

5 | LIMITATIONS

Consistent with the goals of high-quality IPA research (Smith, 2011a), we documented patterns of shame in the lived experience of White male engineering students to demonstrate idiosyncratic complexity and coherence across the group. Thus, the goals of the investigation were to generate contextually robust theoretical insight into the patterns of how students experience professional shame. However, we address a key limitation in conducting data analysis across a team, which may have mitigated our efforts to gain in-depth insight into the personal experiences of shame.

We managed the data analysis across a team of investigators rather than relying on a single data analyst. Although each transcript was primarily analyzed by either the second or third author, both analysts were mentored by the first author throughout this process, and they codeveloped the final findings in consultation with the first author. While data analysis within a team is a standard within engineering education studies, even among those who use IPA (Kirn et al., 2019), such an empirical decision does have tradeoffs. Specifically, in IPA, the interpretive processes must be managed to ensure that the findings are carefully constructed from the lived experience of participants. By opening the data analysis to multiple perspectives, especially to those not directly analyzing the transcript data, there is a risk that the findings will slant toward theoretical perspectives of a phenomenon rather than the perspectives of personal lived experience. We managed our interpretive processes by the lead author refraining from any analytical decisions until he had reviewed the original transcripts as well as the copious analytical documentation from the second and third authors. Only then did the lead author consult with the second and third authors to develop a cohesive way of organizing the findings to be the themes and subthemes that were previously presented. After drafting the initial set of findings, we consulted the fourth and fifth authors who worked with the lead author to design the overall study to ensure that our findings were well justified by the data.

6 | DISCUSSION

We now turn to how the lived experience of professional shame in these participants interacts with existing theory on shame and engineering education research. We organize our discussion around three theoretical knowledge claims that represent the lived experiences of participants in the study. First, we argue that identity development within engineering education is intertwined with the lived experience of professional shame. Second, we contend that, in experiencing professional shame, White male engineering students might respond to their own shame in ways that reproduce the shame experience for themselves and others. Finally, we maintain that professional shame can constructively motivate individuals to separate their evaluations of their global identities from the instances of failing to meet identity-relevant and socially constructed expectations.

6.1 | Shame amid identity development

The identity development of participants was deeply intertwined with their experience of professional shame. Ferguson et al. (2000) found that the psychological experience of shame was connected to an individual occupying an *unwanted identity*, which they characterized as a construct that people perceive themselves to possess when they feel as if they have failed to achieve their self-defined ideals. Our findings demonstrated that participants held a complex relationship with their identities as engineering students and, consequently, their unwanted identities in their professional domains. To be an engineering student represented the best of whom they felt they were and hoped to be. This role afforded them an elevated status within their interpersonal domains outside of engineering and, for these White male participants, a deep sense of belonging within their professional domains. However, in connection with aspirational features of their identities as engineering students, participants also demonstrated patterns of professional shame when they failed to achieve the standards that they had connected to the role of being an engineer. In other words, their unwanted identities were characterized by not being *enough* of an engineer. From their perspectives, being an engineering student generally signaled to their social environment that they were high-performing individuals who were conscientious workers. Accordingly, when they felt as if they failed to achieve such identity-relevant standards, they experienced the painful emotion of shame.

However, participants' experiences of professional shame were not merely connected to feeling inadequate in engineering education. Indeed, the findings also highlighted how they sought to distance themselves from their roles as engineers, particularly when they operated within their interpersonal, relational domains. In other words, their unwanted identities were related to being *too much* of an engineer. In this regard, the experience of professional shame arose because of their roles as engineering students rather than how they performed within this role. When they received validating messages from nonengineering peers, participants did not necessarily feel threatened in relation to their performance as engineer. Rather, they encountered a threat to who they were as relational individuals. Exline and Lobel (1999) labeled this strange phenomenon in a general sense as "sensitivity about being the target of a threatening upward comparison" (p. 307). According to them, such sensitivity is accompanied by a stark feeling of discomfort when individuals perceive that they are a target of upward comparison by another individual and when one also feels concern for the relationship with that individual. In this study, participants described a sense of shame

when their roles as engineering students complicated the way that they could achieve relational needs. As Martin stated in the epigraph of the paper, "I don't like to set high expectations because I don't like causing people to feel disappointment."

The findings of this study bear important implications to literature on professional identity for engineering students. As reviewed elsewhere (Huff, 2019; Huff, Smith, et al., 2019), engineering education research has often examined professional identity with the underlying premise that forming an individual's identity into that of an engineer is a positive outcome (Godwin et al., 2016; Patrick et al., 2018). However, our findings show how a student's professional identity development is a complex process that can lead to mixed patterns in relation to emotions and well-being. Whether participants aspired to the role of being an engineer or whether they sought to distance themselves from the profession, the personal identities they sought to achieve as engineers created the framework for how they felt threatened in their identities and thereby experienced professional shame.

6.2 | Reproducing professional shame

Some study participants responded in ways that likely reproduced the shame experience for themselves and others. The individual responses of these engineering students shed critical insight on an important link between personal and social experiences of shame. As discussed in Theme 3, the White male participants tended to respond to their individual experiences of shame by reinforcing the standards that they felt they had failed. In doing so, they galvanized the socially constructed expectations against which they measured their own performance and that of others.

In reacting to experiences of shame, participants sometimes directed their thinking to how others had failed to achieve similar expectations. Consistent with prior literature on shame (Gilbert, 2003; M. Lewis, 1995; Tangney & Dearing, 2002), participants formed internal responses that blamed others for the events that led to their shame experiences. They sought to recover from threats to their identities by formulating ways that others had failed to achieve similar socially constructed expectations. However, targeting others through blame was ineffective. By engaging in social comparisons, participants reinforced the message to themselves and perhaps to others that their failure to achieve socially constructed expectations could only be acceptable if others had failed more than they had. Such a message did not protect participants from the pain of their experience; rather, it reinforced the strength of social expectations.

While participants reproduced shame through blaming others, we also contend that participants perpetuated the shame experience through their socially avoidant behaviors. Whether participants hid their emotional state or disengaged from thinking about shame altogether, these avoidant behaviors reinforced the narrative that failure in engineering is an aberration rather than a normal part of the experience.

Overall, our findings highlight how in response to professional shame, members of a majority and socially privileged group might enact behaviors that perpetuate master narratives (McLean & Syed, 2015) and socially constructed expectations by which all members of the group feel negatively evaluated. Such a pattern accentuates the importance of studying White male students as active and complex individuals in the systemic processes of inclusion and exclusion within engineering education. While prior work has illuminated the depth at which marginalized engineering students manage others' impressions of them (Danielak et al., 2014; Pawley, 2019; Secules et al., 2018), our finding here demonstrates that these students from a dominant social group are also emotionally engaging with expectations of who they are as engineering students. When they resolve their emotional difficulty by spreading shame to others in their environment, such a coping mechanism only serves to make the master narratives more excluding of all engineering students, especially for those already systemically marginalized.

6.3 | Reframing professional shame to constructively repair the identity

Although participants responded to professional shame experiences in ways maladaptive to themselves and others, they also demonstrated latent ways of recovering from the professional shame experience. Prior literature (de Hooge et al., 2011; Hennigar & Harris, 2014; Leach & Cidam, 2015) maintains that shame can only lead to positive individual experiences if the person experiencing shame can decouple their global identity from a perceived event of failing to meet social expectations. In this study, participants reframed failure events as related to something that they did (or did not do) rather than who they were. Such reprocessing placed the shame experience as something that was more in line with guilt, an emotion that accompanies an attribution of failure to behavioral choices rather than one's identity

(Gilbert, 2003; Tangney & Dearing, 2002). In addition, participants might have initially felt a strong sense of shame but they could also step outside of the shame experience by decoupling their identities from their perceived failure.

Participants also reduced the felt significance of the expectations they believed they had failed. While professional identity research generally values an envisioned trajectory of success of becoming a professional, it is significant that in some cases participants felt positive gains in well-being by learning to be at ease with their failure. Such a strategy was important for self-improvement goals, especially if participants were not fully in control of their success in a certain event.

Finally and perhaps most importantly, participants connected with others who shared their shame experiences, which normalized the painful emotional state as something fundamentally human. Such a strategy relates to Brown's (2006) shame resilience theory, which encompasses "the ability to form mutually empathic relationships that facilitate reaching out to others" (pp. 47–48). We contend that such a strategy of making known one's individual shame experience is critically important in professional domains such as engineering. The findings demonstrate that emotions which accompany failure can be experienced in ways that facilitate belonging rather than isolation when they are experienced as a group. Furthermore, although some of the findings suggest that engineering cultures can be rendered as places that perpetuate shame, other parts of the findings also suggest that professional shame experiences can facilitate a profound connection among engineering students as whole persons and not merely as performers.

7 | IMPLICATIONS AND FUTURE WORK

We intend for this investigation to inspire engineering educators to ask the difficult but important question of how they and their students experience shame in their professional domains. Based on these findings, we infer two key insights about how educators can interact with the professional shame phenomenon. First, participants determined the identity salience of academic tasks based on cues from instructors. Engineering educators can help facilitate healthy experiences of shame by framing the achievement of academic tasks as important but not identity-defining.

Second, faculty can live out an intentional mindset toward shame in their contexts. As highlighted by Pawley (2009), engineering faculty play a crucial role in authoring the master narratives that define what it means to be an engineering student. Accordingly, faculty might help students understand the role of emotions in engineering formation by acknowledging the range of emotions that students (and faculty) experience in engineering education. Professional shame is not a phenomenon that needs to be promoted by faculty as a motivational technique. Students will tap into the shame experience without external aid and might be doing so when they are defensive. However, professional shame is also not a phenomenon that needs to be avoided. Indeed, by maintaining an expectation that shame is not appropriate for engineering students, we contribute to a paradoxical situation by engendering feelings of shame about feeling shame. The findings demonstrated how the study participants demonstrated maladaptive behaviors toward reconciling their negative emotions when they thought that shame was an inappropriate emotion to feel and express. Yet when participants found moments where they could be vulnerable about their difficult emotional experiences, they found a path forward to resolve their experiences of shame with resilience. We contend that when faculty and staff allow space for vulnerability in their interactions with students and thereby model how students can be vulnerable with one another (Brown, 2006), they will facilitate belonging within engineering education contexts.

While this investigation demonstrates suggestive claims related to how White male engineering students contribute to the source of shame through their behaviors, it did not systematically examine how such behaviors are constructed in the social space of engineering education. Future research can examine the cultural landscape of professional expectations through ethnographic methods. This investigation was methodologically well-suited to unpack the individual lived experience of shame in engineering students but not suitable for demonstrating how sources of shame such as master narratives and socially constructed expectations of engineering education come to define the professional context.

In addition, future research can examine the phenomenon among students from social groups who are systemically marginalized within engineering education. It is important to recognize that the findings highlight the phenomenon of professional shame as experienced by White male students. The theoretical framing of professional shame needs considerably more examination in other social groups, particularly those that are marginalized by majority group members, to more comprehensively understand how professional shame operates in the social space of engineering education domains. As such, we see this study as a first step in unpacking how shame contributes to inclusion, exclusion, and socialization in engineering programs.

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